

**THE RELATIONSHIP BETWEEN WHOLE BRAIN THINKING  
MODEL AND PLAYER TYPE THEORY TOWARD THAI  
MMORPG GAME PLAYERS**



**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE GRADUATE SCHOOL  
STAMFORD INTERNATIONAL UNIVERSITY  
MASTER OF BUSINESS ADMINISTRATION  
ACADEMIC YEAR 2014**

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**The Research has been approved by  
Stamford International University  
The Graduate School**

**Title:** The Relationship between Whole Brain Thinking Model and Player  
Type Theory toward Thai MMORPG Game Players

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**Title:** The Relationship between Whole Brain Thinking Model and Player Type Theory toward Thai MMORPG Game Players

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### Abstract

The objectives of this study was (1) to identify and categorize type of game player in MMORPG game; (2) to identify thinking preference of each Thai teenager game player; and (3) To map out and investigate the relationship between MMORPG game player personalities based on player type theory and game players' thinking preferences in order to improve in game development as in turn to increase sales and explore more opportunities for new game development.

**Research Methodology:** The valid sample consisted of 419 MMORPG game players. The employed research instrument was a questionnaire comprising 14 items for MMORPG game players. Content validity of the developed test was verified by the item-objective congruency (IOC) index by three experts.

Research findings were as follows: (1) Content validity of the questionnaire in part 4 as shown by the IOC index were 1.00. (2) Content reliability of the questionnaire in part 4 with 30 pilot respondents were .744. A hypothesis shown very strong evidence of relationship between Whole Brain thinking model and Player type theory with the Pearson Chi-square test at Chi-square = 79.686, df = 9,  $p < .050$ . As Player type theory is a dependent variable, lambda or directional measure applied and the strength of relationship was measured and shown that there was a significantly (Approx. Sig. = .030) moderate relationship (Value = 0.59) between Ned Hermann's Whole Brain thinking model and Bartle's Player type theory.

**Keywords:** MMORPG, Whole Brain, Thinking Preference, Player style, Thailand

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Tanarat Hongpaisanvivat

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# CHAPTER 1

## INTRODUCTION

This chapter presents significant and overall concepts of this thesis which are discussed with different topics as follow:

- 1.1. Statement of the Problems
- 1.2. Research Objectives
- 1.3. Significant of the Study
- 1.4. Scope of the Study
- 1.5. Research Question
- 1.6. Research Hypothesis
- 1.7. Conceptual Framework
- 1.8. Definition of Terms

### **1.1 Statement of the Problems**

In the year of 2014, technology is so dynamic. Even generation Z is generated in this era after millennial generation. New inventive products come out dramatically which those products generate to be more personalized.

According to Dencker (2010), mass customization is explained in terms of business model that allows customer to be able to customize their purchased product to meet their own needs. In the point of view of company, mass customization is defined as “the ability to provide customers with whatever they want, whenever they want it, wherever they want it and however they want it” (Dencker, 2010). It has been dramatically change from mass production era to mass customization era which named as significant competitive advantage in the future. There is an example of “Nike” as they start to launch the products that people can customized by themselves. Actually, before Nike Company launches NIKE ID campaign, there are no large companies that can make profits from employing mass customization. Many companies include Toyota, Dow Jones, and Motorola have employed mass customization but many of them does not work out. However, several large companies are able to implement mass customization successfully including Levis and Apple. Dencker (2010) further stated that with current capabilities, mass

customization is a great technique for brand building but it is still difficult to implement one by one offering compare with such a high consumption volume.

Even though Dencker (2010) exposed that mass communication is difficult to implement, sportswear provided company like Nike Company still provided Nike ID service which allow customers to be able to customize their purchased products from Nike. Customer would able to act as a designer to change, add personal look and their style to their selected item. The customers are able to choose their customization within a limited range of materials and colors to develop their own style of purchased product. This service was initially launched in the year of 1999 and only offer this feature through their website. Online community of Nike ID recently reached 15 million people with such a fantastic customer experience. Furthermore, Nike Company market share has grown from 48-61%. In addition, Nike ID is currently become 20% of store revenue. By the number, this strongly shows how success mass customization technique is offered which could maybe lead to further mass personalize product further on.

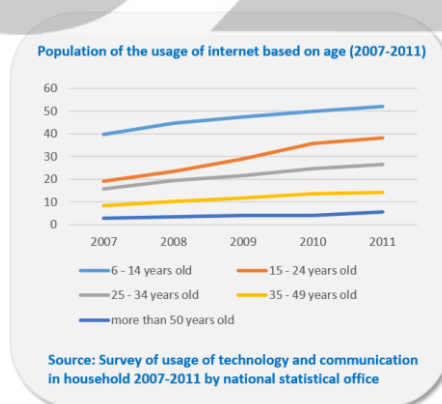
Technology industry becomes more challenging and fiercely competitive. Ones who cannot offer the right product to the right person would go out of the business. To illustrate, “Zynga” was a company that was founded in 2007. A few years later, it becomes one of the world’s biggest game companies as the games they created are very popular among the players in social network, especially via Facebook. The most popular game includes FarmVille, CityVille and Words With Friends with approximately hundreds of millions of players enjoy with these game. Consequently, they can earn large amount of revenue from selling virtual items in the game which players need to spend their real money in order to improve their standing in the games (Manjoo, 2012). Therefore, because of these virtual goods, it can make this company continue growing. In February 2012, it was reported that Zynga earned \$311 million revenue from about 150 million users. In other words, it shows that the actual average revenue per user (ARPU) is around \$2 (Zichermann, 2012). In reality, there are only few players who really willing to spend their real money into the game, which the statistic shows that there are only 3 percent of people who willing to pay. Therefore, the average revenue per user (ARPU) from paying player should be around

\$60 per users. Actually, some game players who really addict to the game are willing to pay over hundreds or thousands of dollars a month to play these online games.

On the other hand, it is important for the game developers to consider about these players as they are one source of the company's revenue. If the number of players who willing to pay money for their virtual goods are decreasing, they need to find new strategies in order to sustain their growth. Therefore, in order to do that, the company should find the strategies that they can retain their existing customers at the same time looking for new targeted customers. Importantly, if game developers understand customers' behaviors, they will be able to offer the right products to the right customers.

Therefore, whichever way to know and understand more about customers would give the better advantage to those ones. The improvement of Internet connections, graphics cards and microprocessors make many video games become omnipresent in our culture, particularly among children and teenager (Delwiche, 2006; Rhyne, 2002). This is the reason why there are many researches and debates over the educational potential of these games (Mitchell & Savill-Smith, 2004). As the matter of fact, ongoing expansion in the number of video game players will lead to the growth of these entire debates in the future (Susaeta et al., 2010).

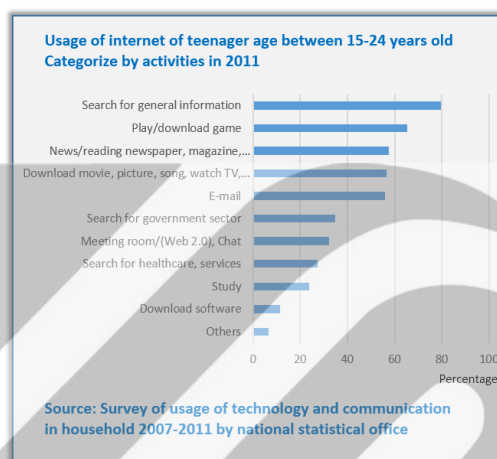
Nowadays, online game industry has played a significant role in Thai economy. From National Statistical Office (2011), it stated that there is dramatically increasing and continuing to grow in the usage of internet of Thai population as shown in figure 1.1 below.



**Figure 1.1** Population of the usage of internet based on age (2007-2011)

**Source:** National Statistical Office, 2011: Online

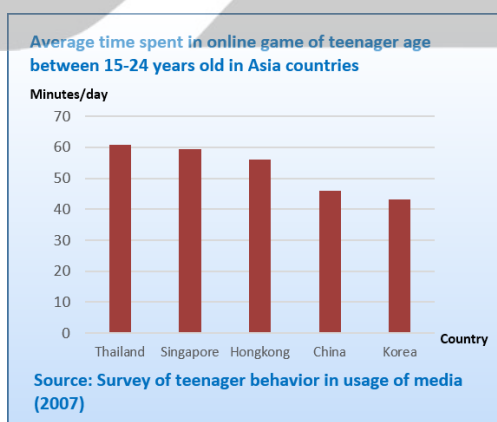
The most usage of internet are teenagers whose ages between 15 and 24. As the figure 1.1 shows that 65.4 percent of them uses internet to play and download games. By the statistic, there is a great opportunity for Thai economy to grow in this field. Therefore, designing games to suit to game players' preferences and experiences becomes more important for game developers.



**Figure 1.2** Usage of internet of teenager age between 15-24 years old categorize by activities in 2011

**Source:** National Statistical Office, 2011: Online

Moreover, national statistical office website shows in figure 1.3 that average time spending in online game of Thai teenager ages between 15 and 24 in Thailand is around 60.7 minutes per day. And, it is the highest among Asia counties at the time of this study.



**Figure 1.3** Average time spent in online game of teenager age between 15-24 years old in Asia countries

**Source:** National Statistical Office, 2011: Online

## **1.2 Research Objectives**

1.2.1 To investigate the proportion of each type of Thai teenager game player in MMORPG game based on Player type theory.

1.2.2 To investigate the proportion of each thinking preference of Thai teenager game player in MMORPG game based on Whole brain model.

1.2.3 To map out and investigate the relationship between Thai teenager MMORPG game player's play styles based on player type theory and game players' thinking preferences based on Whole brain model in order to increase sales and opportunities to improve in game development.

## **1.3 Significance of the Study**

Technology industry becomes very competitive in this century. Therefore, this research is aimed towards an investigation of the relationship between Whole brain thinking preference and Player type theory. By applying the model with the theory, results will lead to better understanding about game players who are active on-line buyers. In addition, this research aims to help game developers to understand the game players' behavior and preferences. As a consequence, game developers will be able to determine the design of games to fit with those buyers. Furthermore, varieties of marketing methods and technique can be applied to attract game players easier and able to sell more to generate greater revenue such as gamification.

## **1.4 Scope of the Study**

The target group of this study would be MMORPG ages between 15 – 24 game players who play more than 1 MMORPG games. The distribution of questionnaires would be in Thailand via online channels. Surveys expectation would cover the sampling of MMORPG game players about 400 respondents.

## **1.5 Research Question**

This research aims to study the relationship of whole brain thinking and players' style of MMORPG teenager game players within Thailand. The research question thus was to what extent, if any, did thinking preference and virtual in-game character correlate with each other?

## 1.6 Research Hypothesis

The following hypothesis was set:

*H1* Whole brain thinking preference and game playing style of Thai teenager MMORPG game player are interrelated.

## 1.7 Conceptual Framework

In this research, researcher apply Bartle's Player type theory to determine each type of game player of MMORPG game genre and Whole brain thinking preference by Ned Hermann. Researcher seek for conclusion if there is any relationship between thinking preference of each person and play style of each person. Researcher states Whole brain thinking preference as an independent variable while a dependent variable is Player type theory. At the same time, researcher defines the correlation between these two variables which both variables are similarly divided into four categories as in the figure below.

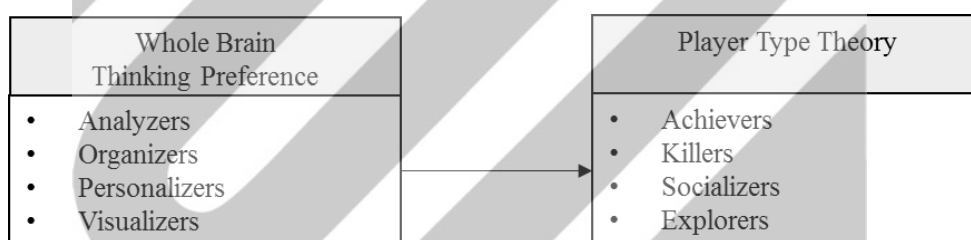


Figure 1.4 Conceptual Framework

## 1.8 Definition of Terms

In order to facilitate the same meaning of terms used in this research, the following brief, working definitions of terms are presented:

### MMORPG

Massively Multiplayer Online Role-Playing Game (MMORPG) is an online game which can serve a large number of game players simultaneously and every game player can have interaction with each other in real time (Steinkuehler & Williams, 2006).

### Thinking Preferences

Thinking preference refers to ability for individuals to act outside based on their preferred Whole Brain dominance (Brian, 2011).

**Summary**

As a result, by understanding these teenagers' thinking preference, development of an online game will become productive. Game developers would be able to enhance in designing game which leads to an increase in revenue by offering personalized game for each game player and send out personalized message, i.e., product marketing, etc. that is suitable for each game player.



## **CHAPTER 2**

### **LITERATURE REVIEWS**

The previous chapter explained the purpose of this study which is to map out and see the relationship between MMORPG game player style based on player type theory and game players' thinking preferences in order to increase sales, opportunities. In addition, it was to improve in game development and apply thinking preference to offer personalized in-game product or promotion by using framework of Player type theory and Whole brain thinking preference model relationship. This chapter provides a review of overall concept and relevant theories among different researches from different researchers who studies of topics as follow:

- 2.1 Brief history of PC/online games play important roles
- 2.2 Brief history of Massively Multiplayer Online Role-Playing Games (MMORPGs) play important roles
- 2.3 Relate researches
- 2.4 Player type theory
- 2.5 Whole brain thinking model

#### **2.1 Brief history of PC/online games play important roles**

The influence of computer games is growing continuingly as research shown that the age of children playing games continue to be younger and internet usage among children becomes more popular. Moreover, the internet access has become widespread since 1990s, which impacted people's working, socializing and behaviors (Dindar & Akbulut, 2014). The Internet becomes an important media role in information age especially for children and youth who are a group that influences by internet usage (Makesrithongkum, 2009). The internet also has a great impact on marketing concepts especially in the game sectors in terms of alerting relationship marketing activities with customers (Maklan & Klaus, 2011).

Online games become interactive because they allow game players around the world to interact with each other in one single platform. Eventually, online games began to become one of important factors of our social culture (Nuangjumnonga &

Mitomo, 2012; Williams et al., 2008). Online games also bring people together to form society which players interact with each other in virtual world that are always on twenty four by seven. These worlds are called “massively multiplayer online games” or MMOs (Steinkuehler & Williams, 2006).

As the computers and online games market grew rapidly, lots of people especially teenagers spend great amounts of time playing online games (Boyle, Connolly, & Hainey, 2011; González-González, Toledo-Delgado, Collazos-Ordoñez, & González-Sánchez, 2013). Challenges for marketing industry in measurement of online game players’ interaction with a game become critical since it is an important key for company sustainability (Tony, Richard, & Paul, 2009). Moreover, there is a few knowledge about how customer experiences on online game that would be from their consumption which might be interpreted into customer value perception (Iyanna, Bosangit, & Mohd-Any, 2012).

## **2.2 Brief history of Massively Multiplayer Online Role-Playing Games (MMORPGs) play important roles**

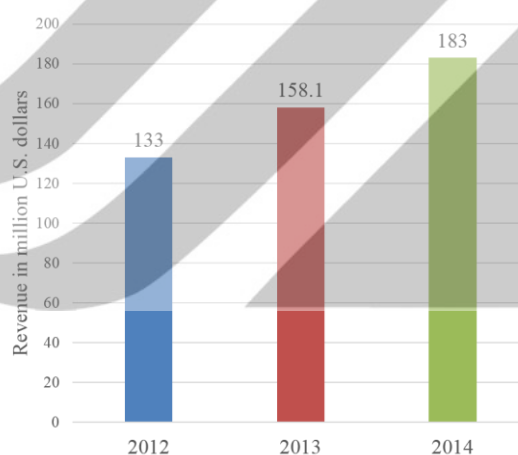
The history of MMORPG was born in 1970s and was started as a “Multi User Dungeons (MUDs)” on the Advanced Research Projects Agency Network (ARPANET) back in the mid-1970s and currently this industry is continuing to grow rapidly (Daniel & Daniel, 2012, chap. 41; Hou et al., 2011; Lo & Wen, 2010; Rezaei & Ghodsi, 2014). MMORPGs are formed of MUD games that offer a persistent 3D virtual world to support thousands of players or player characters to play together on the Internet (Lo & Wen, 2010). “In an MMORPG, the world exists before the user logs on, and continues to exist when the user logs off” (Yee, 2006).

Massively multiplayer online role-playing games (MMORPGs) provide game players many game-play options. It allows players to connect and interact with other players in open-world virtual landscapes which are filled with a variety of possible activities. It allows players to be able to create and control their own avatars to play with others either as allies or competitors in 3D graphical video environments (Steinkuehler & Williams, 2006). These games attract lots amount of players of all ages, nationalities, and occupations, which the average playing time for these games is usually in excess of 20 hours per week (Griffiths, Davies, & Chappell, 2004; Williams

et al., 2008; Yee, 2006a). The popularity of massively multiplayer online role-playing games (MMORPGs) makes it very important to investigate how they impact on game players' lives (Zhong, 2011). Furthermore, it is even more important to understand how to design a successful MMORPG that can satisfy the target game players (Ang, Zaphiris, & Mahmood, 2007; Lo & Wen, 2010; Zhong, 2011) and retain them (Hou, Chern, Chen, & Chen, 2011).

MMORPGs bring a significant role in online game players' interactions within game industries. MMORPG users have experienced more complicated gaming behavior compared to other virtual game players have; so, this issue leads to further research in the MMORPGs industry (Stetina, Kothgassner, Lehenbauer, and Kryspin-Exner (2011); Rezaei & Ghodsi, 2014). In software industry, software developers who provide consumers with personalized product based on individual preference have been shown to be better choices (Murray & Häubl, 2009).

In terms of game business in Thailand, the statistic in figure 2.1 (NIKO Media Research, 2013) presents data on the PC online games revenue in Thailand from 2012 to 2014. It was estimated that the 2014 PC online games revenue for Thailand would be 183 million U.S. dollars as continuing to grow in the industry.



**Figure 2.1** PC Online Games Revenue in Thailand from 2012 to 2014

**Source:** NIKO Media Research, 2013: Online

One of the leading game company in Thailand with the offering of 17 MMORPGs games (only count the ones offer in Thailand) is Asiasoft Corporation Public Company Limited (the “Company” or “AS”). In 2003, “Ragnarok Online” of

MMORPG was licensed from Gravity Corporation, South Korea. Asiasoft was localized into Thai language to serve Thai game players. “This game was an immense success, with the highest peak Concurrent Users of over 110,600” (Asiasoft Corporation Public Company Limited, 2013). Today, Asiasoft has generated their revenues by offering (1) Air Time sale in which players have to pay base on their hours of playing MMORPG games (2) Item sale in which players able to play MMORPG games free of charge but company will sell in-game items such as equipment, accessories or some other items that make that players become better in somehow than other players who do not purchase in-game items. In-game items sometime come with marketing campaign by offering on sales price in specified periods or events in order to attract players to purchase them. Currently, revenue model of online game has shifted from Air Time sales to Item sales. The reason behind is that there are more chances for game players to be attracted because they can play MMORPG games for free which in turn increases more chances to buy in-game items later on (Asiasoft Corporation Public Company Limited, 2013).

## **2.3 Relate researches**

### **Theories of personality**

According to Worth & Book (2014), personalities and behaviors in online game are investigated. The research applies HEXACO traits together with Bartle’s player type theory to investigate relationship between them. In-game behaviors and preferences; previous studies have shown that players have different motivations for playing, preferences for choosing in-game role to act, and engaging in different in-game behaviors (Yee, Ducheneaut, Shiao, & Nelson, 2012). Personality traits have a strong influence on how people think, feel, and behave in the real world which should influence virtual (i.e., in-game) behavior as well (Worth & Book, 2014).

Likewise, several meaningful correlations are found between Five Factor Model personality traits and in-game behaviors in World of Warcraft (Yee, Ducheneaut, Nelson, and Likarish, 2011). Five personalities in the model include extraversion, introversion, agreeableness, conscientiousness and openness to experience. Extraversion is associated with completing more high-level challenges

that require interaction and cooperation with groups of players, while Introversion has more achievements relating to solo activities. Agreeableness is associated with performing more friendly interactions. People who have low Agreeableness are associated with having killed more players in player-versus-player combat. For Conscientiousness, it is associated with having high profession tasks which require diligence to complete. Lastly, Openness to Experience is associated with having completed more exploration achievements. Thus, many of the correlations observed by Yee et al. (2012) seem to be largely consistent with personality and behavior patterns observed in the real world (Worth & Book, 2014).

The relationship between leadership development and Multiplayer Online Battle Arena games (MOBA) are examined using two popular games of this genre: Defense of The Ancients (DOTA) and Heroes of Newerth (HON) (Nuangjumnonga & Mitomo, 2012). In the research, it stated that there are multidimensional influences of motivational factors those were relatively neglected in previous related studies including research by Nuangjumnonga & Mitomo (2012) who have done the research that sought for the correlation of character roles in games and leadership in everyday life. Furthermore, the study also shows how both variables influenced each other by using Multiplayer online battle arena (MOBA) game genre and three styles of leadership that divide players into three categories including carry, support, and ganker. More than that, the research also applied Kurt Lewin's leadership model in which three major leadership styles are described. Firstly, Authoritarian leadership style describes the person who has exclusive control over decision-making process based on their own beliefs, rarely receiving suggestions or input from others (Nuangjumnonga & Mitomo, 2012). Secondly, Democratic leadership style would highly emphasizing participation within groups during the decision-making process. Lastly, Laissez-faire leadership style is characterized as those who delegate tasks with minimal supervision. Members under the direction of laissez-faire leaders feel a sense of autonomy in terms of their working process and decision-making (Nuangjumnonga & Mitomo, 2012). The researchers also conducted a survey regarding gameplay behaviors and leadership behaviors distributed in Thailand to identify the game roles which are taken by the game players and also to identify their leadership styles. The

result of these correlations between relationship of game and leadership styles are interestingly shown.

Some of researches mentioned about gaming environment which it had tremendous impact on players, so they are motivated to engage them (Ryan, Rigby, & Przybylski, 2006). There are many theories of motivation that have been applied to games and motivate the players. Yee (2007) presented studies which focus on Massively Multiplayer Online (MMO) games that involved players to interact in virtual environment (in game) through online game characters. In his research, he identified different factors analysis including overarching, non-exclusive, and motives. These factors were derived from Bartle's type theory.

Another theory had addressed which was called Self-determination. In its early development, researcher focused on motivation based on the inherent satisfactions which were derived from actions (Ryan & Deci, 2000a). Based on Self-determination theory, intrinsic motivation was the core type of motivation underlying play and sport (Frederick & Ryan, 1993, 1995; Ryan, Rigby, & Przybylski, 2006). Additionally, it was a type of motivation related to computer game participation in which people typically played these games because they were intrinsically satisfying (Malone & Lepper, 1987; Ryan, Rigby, & Przybylski, 2006) or, as Bartle (2004) stated that players were seeking "fun".

There are many researches describe about personalize storytelling in Massively Multiplayer Online Role Playing Games (MMORPGs) (Bartle, 2004; Combs, 2004; Crawford, 2005; Eladhari & Lindley, 2004; Klug, 2002). Normally, storytelling in MMORPGs is tied up in both quest systems and also player to player interactions. MMORPGs or the virtual worlds allow interaction of player not only to technical, resource, format, media related of the game itself but also player to player relation. In the result, it is very difficult to provide right kind of personal engagement and emotionally meaningful storytelling to the right player (Tychsen, Tosca, & Brolund, 2006). From the result, there are more opportunities to create variety of the game form in opening up to a broader audience (Klug, 2002). As a result of the issue of personalizing the MMORPG experience, relevance to investigate related game forms for experiences or techniques is mentioned. Research give examples of Pen and Paper Role Playing Games (PnP RPGs) game form (Mackay, 2001; Tychsen, Tosca,

& Brolund, 2006). PnP RPGs game form shares an enormous number of features with MMORPGs, such as the underlying rules systems and themes. In game forms of PnP RPGs, it is possible to generate the exactly kind of personal experience that is challenging by combining collaborative storytelling and imagining with rules in a manner (Tychsen, Tosca, & Brolund, 2006). Furthermore, it is theoretically offers player freedom, in-game consequence of player actions, free manipulation of time, while at the same time generating personalized stories directly tied to the motivations of the game players and their characters (Tychsen, Tosca, & Brolund, 2006). It is explored how PnP RPGs applied personalization during PC generation and how these techniques can be integrated into the design of online games using the technologies currently implemented in MMORPGs. In the end, the improvement of storytelling and better qualities of computer games become greater (Tychsen, Tosca, & Brolund, 2006). By personalizing gaming experience, MMORPG games allow objects and NPCs off to recognize the characters (and possibly the players themselves) in new ways and react correspondingly; as well as allowing the players to create unique characters which allows player to receive more personal gaming experience than currently the norm in MMORPGs (Tychsen, Tosca, & Brolund, 2006). The approach suggested is simpler than systems utilizing e.g. advanced intelligent agents and interactive storytelling systems, and the impact of implementing the player characters models suggested is also much smaller consequence. The strength of the approach is that it is aimed at implementation in the technical and design of existing MMORPGs (Tychsen, Tosca, & Brolund, 2006). From the research, researcher created basic models for designing the character drawn from pen and paper RPGs. It is the purpose to make the game world more personalize to the specific player character. Based on the hypothesis the research, “a personalized gaming experience is better than an impersonal one - that moving around in a virtual game world that responds to your player characters is more satisfactory that getting no reaction from the environment directly related to your character” (Tychsen, Tosca, & Brolund, 2006).

Additionally, Tychsen (2006) stated that some of the main motivations for MMORPG players are creating from their background histories by customizing and role playing their player characters. Integration of their player characters into the storyline of the virtual world also features as a motivation. Furthermore, players also

enjoy socializing and forming relationships through their characters. Base on motivations indicated, character creation opportunities as well as exposure to game content that allows players to take advantage of their characters are increased. Finally, it is possible that customizing features or personalize character creation would be significant while most of the current MMORPGs does not yet provided (Klug, 2002). With stated features, it would allowed MMORPG game developers to offer more personalized experiences to player thus expanding the core market.

### **MMORPG addiction and negative use**

MMORPGs consider as a digital entertainment lifestyle among young people (Hsu, Wen, & Wu, 2009). Most of game player do not need anyone to force them to participate; people voluntarily to use part of their leisure time to seek enjoyment from the game (Rieber, 1996). Moreover, some player still cannot keep themselves from spending an excessive amount of time playing MMORPGs compared to the time playing game consoles (Hsu, Wen, & Wu, 2009; Ng & Wiemer-Hastings, 2005).

Much research has provided verification to reinforce the existence of MMORPG overuse (Hsu, Wen, & Wu, 2009). A marketing survey demonstrates that approximately 9% of game players overuse MMORPGs (ESA, 2005). According to Hsu, Wen, & Wu (2009) approximately 45% of MMORPG users spend more than 20 hours on MMORPGs per week in United States (Ng & Wiemer-Hastings, 2005) and more than 50% of young people play MMORPGs restlessly for 10 hours or more (Yee, 2002). Similarly, some statistics show that there is the same trend of excessive game users in Asia. To illustrate, it is reported that 2.4% of young people in South Korea are game players overuse (Faiola, 2006) as well as 6% of college students in Taiwan considered themselves as being addicted by internet activities, including online gaming (Chou & Hsiao, 2000). As a matter of face, overuse of MMORPG becomes more significant concern which occurs in many countries around the world nowadays. Therefore, many researchers start to use the term of “addiction” to define those MMORPG overuse (Chou & Ting, 2003; Yee, 2006). They believe that MMORPG addiction will make the effects on people’s daily lives for both physical and a psychological level same as the other kind of modern day addiction such as internet addiction. As a result of addiction, it creates the huge impact on addicts

which they always alienate themselves from the society as well as ignore the interpersonal relationships with other people. At the same time, they also ignore their academic performance and lose their sense of time (Chiu, Lee, & Huang, 2004; Chuang, 2006; Rau, Peng, & Yang, 2006). Additionally, Griffiths (1998) also stated that some heavily addicted game players request for the psychological intervention to help them from this problem in order to bring them back to their normal life which they can interact with other people in the society. More than that, it is reported that some heavily addicted game players are very suffer from physical problems; for example, insomnia (Yee, 2002), epileptic seizures (Chuang, 2006), and even sudden death in some rare cases (Hsu, Wen, & Wu, 2009).

Because of the negative impacts of MMORPG addiction, it attracts many research communities and government regulatory agencies to concern more about this problem (Chiu et al., 2004; Chuang, 2006; Rau et al., 2006; Wan & Chiou, 2006). However, there is no any solid method to prove the cause of this modern addiction. Some researchers use pathological gambling as the criteria by comparing MMORPG addicts with people who are gambling disordered. It seems that the indication of illness for the online game and internet addiction are similar to those who love to play gambling (Chou & Ting, 2003; Griffiths, 1998; Young, 1998).

Since the number of game addicts seems to be increasing more and more along with the trend of internet addiction as the time pass by, and there are also many negative impact of these modern addictions. Consequently, many researchers try to stop and prevent this problem by establishing and applying many approaches.

The first possible approach is that the game server will force the users to stop their game if they play over the time limited by the server. To illustrate, Chinese government has developed a monitor system that count the number of hours of user's game play. With this anti-addiction system, it can provide some protection to those game players. If they spend time playing game exceed a certain amount of game play, their game characters will be lose power and experience points simultaneously. Thus, in order to not lose any points in game, these players will have to play game only within the time limit and they will be less addicted to the game automatically. However, in reality, most of MMORPG users try to avoid that anti-addiction system

by creating more than one account and have multiple characters so that they could log on the game with another character in order to continue to play.

The second approach is to identify risk and potential addiction to inform them some warnings in advance or appropriate education regarding to the addiction. In order to identify who are considered as potential addicts, the previous research on MMORPG addiction stated that some personal attributes such as personality, gender, age, skill, family structure, and playing habits of the game players are the significant factors that should be considered. In other words, these factors are the important determinants that reflect the characteristic of those game addicts. Therefore, it is possible to use each person's attributes to predict the risk of addiction (Chiu et al., 2004; Lo et al., 2005). Although this approach might be effective to reduce number of addicts, there is also a limitation because it is difficult to ask users to inform about their overall lifestyle and provide their personal information regarding to the game usage. Therefore, using this approach will have a limitation towards the practical use of predicting the possibility of addiction and early preventing it.

Another approach that has been used to prevent the game addiction is to change the design of users' game playing experience. Mostly, game players perceive the experience from their interaction with the game design and features of the game including episodes, music, sound and light effects, and virtual scenes. Different level of the game design features might make different people perceive the different gaming experience. In other words, there is a correlation between the design features of the game and the game players' experience. Thus, by changing the characteristics of MMORPG design features might be effective way to adjust the experience of the game player. Game players can perceive experience in both positive ways such as getting more fun and enjoyment, and in negative way such as sense of aggression. So, it is possible for game developer to change the design of the game in order to make control over game players which result to make game players less additive to the game.

Importantly, it is stated that the approach of "user experience design" is considered to be the approach that has been successfully applied in both action (Hsu, Lee, & Wu, 2005) and strategy games (Hsu, Wen, & Wu, 2007). Choi and Kim (2004) applied this approach to "explore the relationships between the MMORPG

game players ‘experience and perceived fun by dividing the design factors of MMORPGs into two interaction levels, personal and social’ (Hsu, Wen, & Wu, 2009). Later, they found that by controlling these two design factors, they could manipulate gaming experience of the game players (Hsu, Wen, & Wu, 2009). For instance, the game player who gained positive experience will have more loyalty and be addicted more to the game. Therefore, this approach allows more understanding to us about the perspective of the game players. Nevertheless, it seems that personal and social factors are too rough. “The factors can still be decomposed from the conceptual level to the implementation level in order to provide specific suggestions for user experience design in MMORPGs” (Hsu, Wen, & Wu, 2009).

In 2002, Yee has mentioned in his research about classifying the possible causal factors of MMORPG addiction into motivational factors and attraction factors (Yee, 2002). For motivational factors, these are the factors in our “real life that may cause people to overuse the game”; for example, level of self-esteem, stress and other real life problem (Hsu, Wen, & Wu, 2009). Importantly, these factors can be used to identify the high risk addiction groups. To illustrate further, people who are very stress with their real life might have higher risk of being addicted as they always excess to the game in order to let go of their stress. Even though the motivational factors can be used to identify the risk of the group, these factors still depend on individuals. It is difficult to develop the game that can be matched with every game player’s needs and related to their personal real life problem.

On the other hand, Yee stated in his research that attraction factors which include achievement, relationship and immersion, can make us more understand about the addiction problem from the experience design perspective rather than motivational factors. Furthermore, he also studies about “the relationship between these motivational factors and their subcomponents on users’ playing hours” (Yee, 2002). In fact, we know that the reason why people are addicted to the online game is also because of a psychological dependency. Thus, if we want to understand those MMORPG users’ perspective more in depth, we cannot focus only on users’ behavioral dependency (e.g. playing hours), but we need to understand their psychological symptoms also.

### **In-game advertising**

In fact, there are several advantages for advertisers to use online game as a tool to apply one of the marketing technique which is an advertisement. Advertisers are able to use this channel to provide some information in the specific environment which traditional media is unable to transmit. Moreover, in-game advertising usually uses lower cost and it “can catch the attention of a user for a longer period of time than traditional commercials” (Ferrazzi et. all, 2003). Also, the information that is collected by advertising agencies from this type of advertising can be easily record via online. The data about the customers including their name, address, buying preferences or the acquisition history will be recorded by using tracking and collecting online system (Ferrazzi et. all, 2003). More than that, there is another important advantage of in-game advertising which is “packing of a message in an entertaining environment”. When customers want to buy things via this type of advertisement, they need to communicate with the sellers or producers which can increase the connectivity between them and they can also give some opinion about the advertised products (Ferrazzi et. all, 2003).

Most of the games make people get some feeling and emotions while they are playing the game. As a consequence, because of the emotions, this makes game players attach to the game and concentrate with their screen. So, when the advertisers send out some information throughout the game, the game players will easily receive that information. Moreover, by sending message through the game channel, it is possible for advertisers to measure how fast the game players response and also analyze the impact of the information that has been sent. In addition, as reported by Abrudan (2009) that “in-game advertising has a high rate of acceptance”, there are more than 70% of the game players feel that this online channel is desirable and appropriate to use for promoting the products (Abrudan, 2009).

### **Educational massively multiple online role-playing game**

As we all know, many children and teenagers spend lots of time playing computer whether it is the applications of social network or playing online games. However, in this research, the researcher will only focus on the people who love to play games. Even though there is the problem of addiction which is considered as

negative effects, there is also positive side of playing online game. As a matter of fact, when you are playing games, you need to think how you can improve your characters to be more powerful and better than other people in the game. Therefore, this might be a reason that game players can learn something from playing games.

Indeed, as many researchers have discovered that “playing games” does not always cause negative effects to game players; therefore, they start to study about the advantages of playing game. Recently, “Game-based Learning or GBL” is an interesting study that many researchers start to have more concerns. “There are many studies that have been conducted on the design principles and models of GBL (Hou, 2011).”

For instance, Quinn (1994) proposed the research name “The design and models of educational digital games” in the year 1994, Amory and Seagram (2003) proposed “The Game Object Model (GOM)”, and Kiili (2007) propose the study called “Problem Based Gaming (PBG)”. Likewise, there are many researches that have been published such as “study on the attitudes of the gamers and learners toward games and discussions of the feasibility and effectiveness of digital games as a teaching tool” (Hou, 2011).

Nowadays, game developers have created and developed many types of games that people can enjoy playing them by choosing the one they like. However, MMORPGs are considered as the particular types that popular among the students. As a consequence, many researchers have studied about the educational potential of MMORPGs in order to explore the benefits of playing this type of game that students can receive so that children are not only receive happiness, but also receive some knowledge related to their education. As a result, it is found that most of the MMORPG game “have stories and are highly interactive as they involve diverse problem-solving quests, realistic scenarios, role-playing, and team-work mechanisms that stimulate gamers’ internal motivation” (Dickey, 2007). Because of the features mentioned above, MMORPGs can be considered as instructional strategies.

To illustrate, almost every MMORPGs game have the quests that allow the game players to solve it, so players need to use problem-solving skill in order to explore, contemplate and complete the quests (Johnson & Mayer, 2010; Kiili, 2007). Because of this reason, game players which most of them are students can indirect

develop their problem-solving skills by just participate in the gaming activities (Bahr & Rieth, 1989; Inkpen, 1994). Actually, if the problem solving quests in the game and educational content are combined together, this might make those students have better motivation to work on a problem which can make them interested more in learning and studying (Ke, 2008).

In fact, most of the MMORPG games' environment are developed and created to be similar to our real life environment; therefore, people can learn from the realistic situation. Some researchers called this learning strategy as "Situating learning approach". For example, in real life, we have to communicate with other people especially when we work as a group. Similarly, a game player needs to communicate with other people in the game in order to complete the group quest that is required by the game. Another example is that when one player wants to trade items with other players in the game, they need to negotiate and make an agreement such as how much of the deal. With this example, it seems that what happen in the game is "realistic situations" that people always face in their real life. Furthermore, Hou (2011) stated in the research that the results of situated learning between the online learning activities that involve role-playing and without role-play are different. The results show that online learning activities that involve role playing give a better result in situated learning.

To sum up, "MMORPGs not only provide realistic situations, but also provide gamers with role-playing and group quest opportunities; as a consequence, these allow game players to incorporate collaborative learning, role-playing and situated learning strategies" (Hou, 2011). Also, with the educational quests provided by the MMORPGs can make many game players learn and have the potential to improve their learning strategies which they can adapt to their real life. On the contrary, it is stated that "most of the available educational games only focus on combining learning content with gaming and rarely incorporate instructional strategies" (Gunter, Kenny, & Vick, 2008).

## **2.4 Player type theory**

One of the major concerns about MMORPGs study is to identify the motivations of game players to engage in gaming environments. Bartle's (1996)

player taxonomy was among the first studies to describe player motivations in virtual worlds. This player type theory was stated by Bartle that there were four main reasons why people continue playing Multi-User Dungeon (MUDs: ancestors of MMORPGs) which were to achieve in the game, impose others, explore through the game, and socialize with other players. This theory first started off with taxonomy of game players of MUDs or Multi-User Dungeon which were the multiplayer online game that allowed many players to join at the same time. According to Bartle's player type theory, there are four things that people typically enjoy personally as depicted in figure 2.1 below about MUDs are:

#### **2.4.1 Achievement within the game context**

“Achievers” is a type of players who always set goals or mission by themselves and try to achieve them. In MMORPG game, they are the ones that try to gain points and reach next levels as their main goal. They will explore only to seek for new items or treasures. On the other hand, they will start socializing when they want to know about how to improve their points in the game and gain more knowledge to apply to be the better players in the game. Likewise, they will go out to kill others only to eliminate rivals or get rid of people who get in the way or gain some points which awarded from killing other players. This group of player is focusing on master the game. They analyze which ways they will accomplish the game and achieve them base on their actions. They focus on acting (role play in the game, mission and goal) and world (game environment that made them accomplishing something in the game).

#### **2.4.2 Exploration of the game**

“Explorers” is a type of players who tries to know as much as possible about the virtual world in terms of mapping. They usually go in the wild and out-of the way places. At the same time, they try to seek new interesting places and features in the game. In order to allow them to access to other new places, these Explorer type of players, like Achiever type, will start playing to gain more scores in order for them to reach their such new world. They would only socializing when they want to seek for

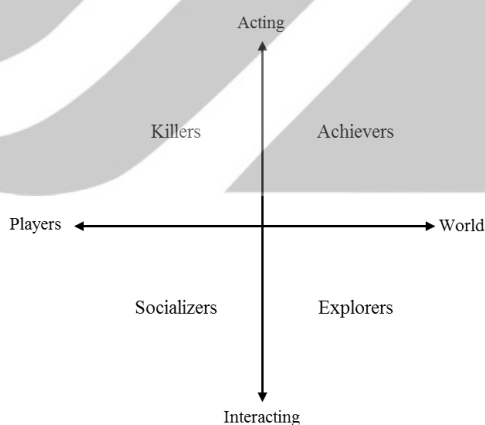
new ideas. This group of players focus on interacting with the world and always proud of knowing about the games more than other players do.

### 2.4.3 Socialization with others

“Socializers” is another type of players that uses the role-playing game to interact with other players. They are interested in people over than context of the game itself. These players will play to gain scoring points once they are allowed to be able to gain access to some communication which are available only for the one who meet the target. Furthermore, they will start exploring behavior when they only want to know what others are talking about. However, they can act as Killer only when they want to revenge someone who has cause pain to their friends.

### 2.4.4 Imposition upon others

“Killers” is the last type of players who aims to use the tools provided by the game to offend other players. They usually find weapons and apply them to other players in the game. As the matter of fact, they will try to explore to new places in order to get new tools or weapons to use to kill other group of players, while they also want to socialize with other players in the group. Significantly, they always feel proud of their reputation and fighting skills.



**Figure 2.2** Player type theory graph

**Source:** The Journal of Virtual Environments, 1996

## 2.5 Whole brain thinking model

Since the past, there are large numbers of researches that have tried to identify

thinking styles of people. Within this research, researcher has applied Herrmann Brain Dominance Instrument (HBDI) to identify different thinking styles. By combining Triune Brain theory with Left Brain/Right Brain theory, Whole brain thinking preference model is developed. The model was developed in the year of 1996 which was based on the belief that parts of the human's brain (left and right hemisphere, cerebral and limbic brain) form a grid that were divided into quadrants resulting in different brain dominance of each person (Orcik, Vrgovic, & Tekic, 2013).

### **2.5.1 Triune Brain theory**

Triune Brain theory was invented by Paul McLean in 1968. The theory itself separates human brain into three layers which work differently for each part (McLean, 1990). It consists of the reptilian brain (core brain), the limbic system (mid layer), and the cerebral system (outer layer) which McLean (1990) described as follows:

The Reptilian brain functions to control every basic function of our living. It maintains patterns and habits of human body while also controls primitive behavior, sensation, and survival. Environment does minimal effects to this part of brain.

The Limbic system is considered to be primary centers of emotion thinking, form and sequence which plays a key role in memory transformation and retrieval (Andrew, 2001). McLean acknowledges that the senses we feel about the rationality of our thoughts has its roots in this system of emotional intelligence (MacLean, 1990).

The Cerebral system (Neocortex) is a part that does all planning, analysis, synthesis, reasoning thinking, problem solving and decision-making. It is considered to be the most complex part. It not only provides logical and formal operational thinking possible and allows us to plan for the future but it is also kept all gained knowledge and allows us to reuse that knowledge in the future.

### **2.5.2 Left Brain/Right Brain theory**

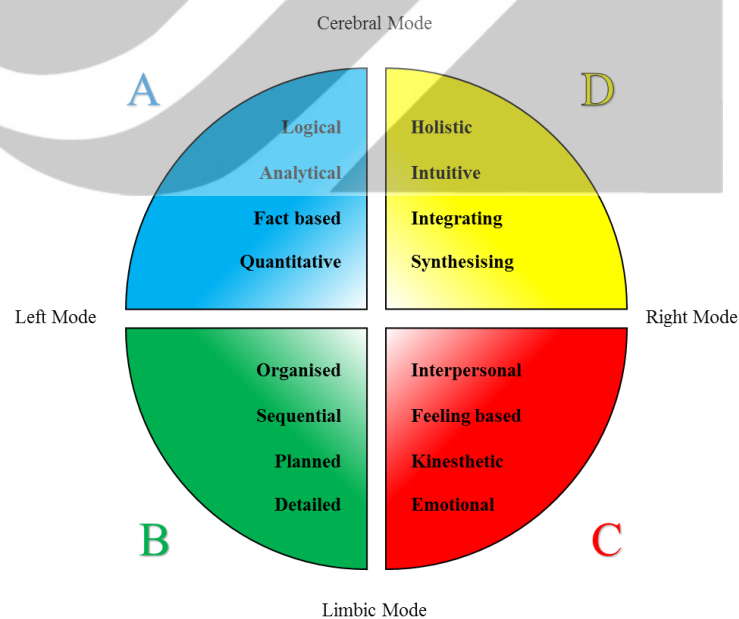
Theory of Left Brain/Right Brain was discovered in 1970 by Roger Sperry. The experiments revealed that the left and right hemispheres of the brain were actually functioning independently from each other. Right side of the brain functions to recognize faces, express emotions, have musical ability, be intuitive, creative, humor

and metaphor. However, left side of the brain is able to function as analytical, language, logic, critical thinking, numbers, time sequencing and reasoning.

### 2.5.3 Whole Brain thinking preference model

Whole Brain Thinking is the ability for individuals to act outside of their own preferred Thinking Preference (Brian, 2011). Each individual has their own dominance thinking preference; therefore, tools to measure are needed. Ned Herrmann clustered human brain into four different parts by combining between the theory of Triune Brain (McLean, 1990) and Left Brain and Right Brain theory (Roger, 1985; Springer and Deutch, 1985). Ned Hermann developed the Whole brain model that can be used to measure each person and categorize them into one of the four quadrants by using Herrmann Brain Dominance Instrument as a tool. The result shows degree of dominance of a person in four thinking structures of human brain.

The Whole Brain model divided human brain into a grid that contains four equal quadrants, and labeled by using first four letters of alphabet to indicate A as an upper left quadrant, B as a lower left quadrant, C as a lower right quadrant, and D as an upper right quadrant. The letters A and D represent the cerebral system, and the letters B and C represent the limbic system (Herrmann, 1996; Brian, 2011) as shown in the figure below and described later on.



**Figure 2.3** Whole Brain Model

**Source:** Herrmann, W.E., 1996

**Quadrant A**

This quadrant refers to “Analyzer” who deals with logical, analytical, fact based, and quantitative. Analyzer tends to think logically, analyze facts and process numbers. Persons who rely in this quadrant will perform logic thinking to do problem solving and have realistic thinking (Rittippant, Ruyaporn, Hongpaisanvivat, Limrahaphan, & Kasemweerakul, 2013).

**Quadrant B**

This quadrant refers to “Organizer” who deals with organization, sequential thinking, planning and detail. Organizer tends to make everything goes smoothly and perfectly based on their plans. Persons who rely in this quadrant also like to get things done on time. They are detail oriented, do not use emotion to make a decision, tend to avoid risks and do everything conservatively (Rittippant, Ruyaporn, Hongpaisanvivat, Limrahaphan, & Kasemweerakul, 2013).

**Quadrant C**

This quadrant refers to “Personalizer” who deals with kinesthetic, emotional, feelings based and interpersonal skills. Personalizer tends to be people-oriented and tender. Persons who rely in this quadrant always care others’ feeling and look to other people’s values. They will be a friendly, trusting and empathetic person (Rittippant, Ruyaporn, Hongpaisanvivat, Limrahaphan, & Kasemweerakul, 2013).

**Quadrant D**

This quadrant refers to “Visualizer” who deals with intuitive thinking, integration, synthesizing, and a holistic approach. Visualizer tends to be able to see the big picture and try to solve problem based on their instinct. Persons who rely in this quadrant are visionary and imaginative. They like changing, challenging and risk taking while dislikes any forms of rules and regulations (Rittippant, Ruyaporn, Hongpaisanvivat, Limrahaphan, & Kasemweerakul, 2013).

Even though each of human being has different brain dominance, most people tend to have at least one dominant or preferred quadrant based on whole brain model. There are no better or worse among each of dominance quadrants. Eventually, dominance quadrants will express Thinking Preference in that person. These will lead to different game playing style in MMROPG genre.

#### **2.5.4 Herrmann Brain Dominance Instrument (HBDI)**

Herrmann Brain Dominance Instrument (HBDI) is a tool to measure the degree of preference between each of the four individual thinking structures (quadrants) and each of the four-paired structures (modes). HBDI is the only assessment based on the metaphor of how our brain actually works. It is only used to determine thinking styles and preference rather than the psychology of personality or behavior. The Whole Brain model divided human brain into four equal quadrants, and labeled by using first four letters of alphabet including A as an upper left quadrant, B as a lower left quadrant, C as a lower right quadrant, and D as an upper right quadrant. The letters A and D represent the cerebral system, and the letters B and C represent the limbic system (Herrmann, 1995; Brian, 2011).

#### **Summary**

Actually, there has been relatively little research conducted on the specific connections between personality and in-game behavior. As researcher has mentioned above about “Big Five or Five Factor Model of personality”, which consists of the traits of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (John, Naumann, & Soto, 2008) and HEXACO model of personality which is similar to the Five Factor Model of personality (Ashton & Lee, 2007), both of them are only focus on how human’s personality relates to in-game behavior. Nevertheless, researcher has focused on the relationship between thinking preferences of the game players and their behavior in the game. As a result, the conceptual framework as shown in Chapter 1 is created.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

This chapter provides details of the action research design by using a quantitative analysis consistent with statement of the research specified in chapter 1.

Therefore, this part includes

- 3.1 Research method
- 3.2 Data sources
- 3.3 Population and sample size
- 3.4 Data Collecting Procedure
- 3.5 Data analysis and statistic tools
- 3.6 Questionnaire

#### **3.1 Research method**

This research is designed to be correlational research since researcher wants to find the relationship between two variables.

#### **3.2 Data sources**

The main data sources are from primary data in forms of quantitative data which is gathered by using questionnaire.

#### **3.3 Population and Sample Size**

Respondents who are chosen to be the sample group of this research are 419 Thai teenager game players who have played more than 1 MMORPG game genre and ages between 15 – 24 years old. According to annual report from Asiasoft Corporation public Company limited (2013), they are offered 57 online games in total and registered game IDs are 135 million. In fact, among these online games offer by Asiasoft Corporation, Thai Ragnarok online game is considered to be the most successful MMORPG game in Thailand as the registered IDs has reached about 1 million. However, because of this research target respondents are specific in age and the number of MMORPG game played, the number of research population cannot be

count exactly; therefore, researcher applies W.G. Cochran theory to calculate size of sample group.

The size of sample group in this study is calculated by using W.G. Cochran (1953) equation as follows:

$$n = \frac{P(1-P)(Z)^2}{e^2}$$

Remark;

$n$  = sample size

$P$  = the estimated proportion of an attribute that is present in the population

$Z^2$  = the abscissa of the normal curve that cuts off an area  $\alpha$  at the tails

$e$  = significant level (0.05)

From equation, the sample size can be calculated as follows;

$$\begin{aligned} n &= \frac{0.5(1-0.5)(1.96)^2}{0.05^2} \\ &= \frac{0.5(0.5)(3.8416)}{0.025} \\ &= \frac{0.9604}{0.025} \\ &= 384.16 \text{ or } 384 \text{ respondents} \end{aligned}$$

The calculated sample size of respondents are equal to 384 respondents which is sufficient but expected number of samples in this research will be about 400 respondents. Data collection is conducted by using a technique of simple random sampling through online channel.

### 3.4 Data Collecting Procedure

Researcher collects quantitative data by using structured survey with a set of fourteen questions. Questionnaire is one of the most commonly used as a data collection tool in research because it is time-saving tool to collect large amount of data within the time limitation of research (Sukchitt, 2011). The procedures for collecting data are as follows:

### Collecting information

Researcher collects information from various sources such as journals, articles, conference paper, organizations annual reports, and internet.

### Conducting questionnaires

Researcher conducts questionnaire by using internet such as Facebook, dekd.com, or online game forums as tools to collect data of:

Part 1: Sampling filter

Part 2: Demographic information

Part 3: Game players' thinking preference

Part 4: MMORPG Game players' style

### Content Validity

Index of Item-Objective Congruence (IOC) is applied in the questionnaire by three experts in this field which shown in Appendix C. Researcher applies improvement to the questionnaire based on their recommendations.

### Reliability

Reliability analysis is applied by launching pilot test with a random sampling of 30 MMORPG game players. By using Cronbach's Alpha method, the Alpha Coefficients result shows as followed:

**Table 3.1** Number of pilot test (Case Processing Summary)

	N	Percent
<b>Valid</b>	30	100.0
<b>Excluded</b>	0	0.0
<b>Total</b>	30	100.0

Table 3.1 shows the total number of pilot test which shows that there are 30 respondents were participated.

**Table 3.2** Cronbach's Alpha (Reliability Statistics)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
<b>0.744</b>	0.747	5.0

From Table 3.2, the alpha coefficient for the five items from last part of questionnaire (Game player's style) is .744, suggesting that the items have relatively high internal consistency.

**Table 3.3** Inter-Item Correlation Matrix (Inter-Item Correlation Matrix)

	Question 1	Question 2	Question 3	Question 4	Question 5
Question 1	1	0.588	0.433	0.127	0.416
Question 2	0.588	1	0.447	0.175	0.191
Question 3	0.433	0.447	1	0.469	0.391
Question 4	0.127	0.175	0.469	1	0.478
Question 5	0.416	0.191	0.391	0.478	1

Table 3.3 indicates the correlation between each question in last part of questionnaire (Game player's style).

**Table 3.4** Cronbach's Alpha if Item Deleted (Item-Total Statistics)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Question 1	10.77	10.875	0.532	0.479	0.693
Question 2	11.03	11.137	0.457	0.408	0.717
Question 3	11.53	9.637	0.615	0.402	0.657
Question 4	11.43	10.599	0.439	0.361	0.726
Question 5	11.37	9.757	0.513	0.376	0.699

Table 3.4 indicates the Cronbach's Alpha for each question in last part of questionnaire (Game player's style). Question number 3 is the most reliable and should not be deleted.

### 3.5 Quantitative Data Analysis

Researcher analyzes data variables using SPSS program to compute results. The outputs of the program presents in chapter four (Research Analysis and Results) and results of respondents are calculated with the following steps:

#### Descriptive statistics

Researcher uses descriptive statistic to describe the demographic variables as gender, age, education level, income level, game MMORPG played and favorite game genre by mean, frequency distribution and percentage.

#### Inferential statistics

Since researcher designs questionnaire in part 3 and 4 to be nominal variables therefore, inferential statistics with Chi-Square test are applied to test hypothesis and answer research question whether is there any evidence of relationship between whole

brain thinking model and player type theory or not. Strength of relation between variables are be measured using Lambda or directional measure.

### **3.6 Questionnaire**

Since the respondents of this research are Thai teenager MMORPG game players and conduct in Thailand; therefore, the questionnaire is developed under both English and Thai language for respondents to clearly understand the meaning of each question. The questionnaire is designed and divided into three main parts as follows:

#### **Sampling filter**

For the first part of questionnaire, respondents are asked to answer these questions first. First question, respondents are asked that how many MMORPG games they have played. Respondents who have never played MMORPG games or play only one game before would be screened out and not able to answer the rest of the questionnaire. The reason is that researcher would like to focus on game players only. Respondents who have played many MMORPG would likely know their style better than never or played on 1 MMORPG game. Second question is asked about how often respondent usually play MMORPG game to know more about respondent's game playing frequency. Last question in this part asked about favorite game genre in order to use the information for further analysis.

#### **Demographic**

For the second part of questionnaire, respondents' background including gender, age, studying and working status, income level, and education level would be surveyed. This part consists of 5 questions as below:

#### **Game player's thinking preference**

For the third part of questionnaire, respondents would have to choose five marks that represent their skills in order to categorize them into one of the four thinking preference by using condensed HBDI. There are five choices of each thinking structure (quadrant). The most frequent thinking structure that each respondent chosen would be determined the respondents' thinking preference.

If a respondent chooses Analytic, Technical, Problem-solving, Logical, Mathematical; he/she is categorized into quadrant A.

If a respondent chooses Planning, Organize, Detailed, Dominant, Reliable; he/she is categorized into quadrant B.

If a respondent chooses Extrovert, Empathetic, Communicator, Teamwork, Emotional; he/she is categorized into quadrant C.

If a respondent chooses Holistic, Synthesizers, Creative, Innovating, Integration; he/she is categorized into quadrant D.

### **Game player's style**

For the last part of questionnaire, respondents have to answer 5 questions in order to score and be categorized into one of the four player styles by using condensed Gamer DNA. There are four choices of each question and each choice represents one type of player style.

### **Summary**

In summary, the research design and research methodology with player styles and their thinking preferences are key contributors for the success of this research. At the end, the quantitative data from the questionnaire is analyzed to determine the research findings of this research which will be found in the next chapter.

## CHAPTER 4

### RESEARCH FINDINGS

The previous chapter explained methods of findings for this study. In this chapter, results from descriptive and inferential analyzed of respondents toward hypothesis test result are provided. Total respondents are 623 in period of two months. As researcher specified to focus only study group at age 15-24 years old; therefore, total of 454 MMORPG game players who play more than 1 MMORPG game and responded to the questionnaire are selected. Additionally, researcher screened out invalid questionnaires that are caused by invalidated some invalid cases from part III of questionnaire. At the end, there are 419 validated questionnaires. This chapter divides into topics as follow:

- 4.1 Personal data of respondents
- 4.2 Whole brain thinking of Respondents
- 4.3 Player type of Respondents
- 4.4 Whole brain thinking with player type
- 4.5 Analyzers towards player styles
- 4.6 Organizers towards player styles
- 4.7 Personalizers towards player styles
- 4.8 Visualizers towards player styles

#### **4.1 Personal Data of Respondents**

Personal data of the respondents obtained from questionnaires are analyzed and presented in the following findings.

**Table 4.1** Sampling filter of correspondents follow by numbers of MMORPG played

<b>Numbers of MMORPG played</b>	<b>Frequency</b>	<b>Percent</b>
<b>2-3 games</b>	153	36.5
<b>4-5 games</b>	35	8.4
<b>More than 5 games</b>	231	55.1
<b>Total</b>	419	100.0

Table 4.1 shows the analysis of game played by group of the respondents. The survey shows that 55.1 percent (n=231) have played more than 5 MMORPG games which is the majority group of respondents and followed by 36.5 percent (n=153) have played 2-3 MMORPG games. This finding pointed out that the respondents are ones who have experienced with many MMORPG games before which lead to better understanding with their own game player style's responses.

**Table 4.2** Sampling filter of correspondents follow by Frequency of playing

MMORPG		
Frequency of playing MMORPG	Frequency	Percent
Less than 4 times per month	69	16.5
1 time per week	21	5.0
2-3 times per week	63	15.0
More than 3 times per week	266	63.5
Total	419	100.0

Table 4.2 shows the analysis of frequency of MMORPG game played of group of the respondents. The survey shows that 63.5 percent (n=266) play more than 3 times per week which is the majority group of respondents. This finding also pointed out that the respondents are ones who have played MMORPG games often which also lead to better understanding with their own game player style's responses.

**Table 4.3** Sampling filter of correspondents follow by Favorite game genre

Game genre	Frequency	Percent
MMOPRG	154	36.8
MOBA	188	44.9
FPS	49	11.7
Casual	14	3.3
Web	7	1.7
Other	7	1.7
Total	419	100.0

Table 4.3 shows the analysis of favorite game genre of group of the respondents. The survey shows that 36.8 percent (n=154) consider MMORPG as their favorite game genre, 44.9 percent (n=188) consider MOBA as their favorite game genre.

**Table 4.4** Demographic characteristic of correspondents follow by Gender

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
<b>Male</b>	335	80.0
<b>Female</b>	84	20.0
<b>Total</b>	419	100.0

Table 4.4 is the analysis of gender group of the valid respondents. In the above table, it is found that major group of respondents who are at age between 15-24 years old at 80.0 percent (n=335) are male and followed by 20.0 percent (n=84) are female.

**Table 4.5** Demographic characteristic of correspondents follow by Age

<b>Age</b>	<b>Frequency</b>	<b>Percent</b>
<b>15-24 years</b>	419	73.1
<b>More than 25 years</b>	154	26.9
<b>Total</b>	573	100.0

Table 4.5 is the analysis of age group of the respondents. In the above table, the survey shows that the total numbers of focus group of this research are 454 respondents. In addition, there are some respondents who kindly responded the survey and ages more than 25 years old at 27.1 percent.

**Table 4.6** Demographic characteristic of correspondents follow by Status

<b>Status</b>	<b>Frequency</b>	<b>Percent</b>
<b>Studying</b>	196	46.8
<b>Working</b>	147	35.1
<b>Studying and working</b>	63	15.0
<b>Neither both</b>	13	3.1
<b>Total</b>	419	100.0

Table 4.6 is the analysis of status group of the valid respondents. In the above table, it is found that 46.8 percent (n=196) is currently studying and 35.1 percent (n=147) is currently working.

**Table 4.7** Demographic characteristic of correspondents follow by Income

<b>Income</b>	<b>Frequency</b>	<b>Percent</b>
<b>Less than 10,000 Baht</b>	14	3.3
<b>10,001 – 20,000 Baht</b>	56	13.4
<b>20,001 – 30,000 Baht</b>	91	21.7

**Table 4.7** Demographic characteristic of correspondents follow by Income (Cont.)

<b>Income</b>	<b>Frequency</b>	<b>Percent</b>
<b>30,001 – 40,000 Baht</b>	35	8.4
<b>More than 40,000 Baht</b>	14	3.3
<b>Missing</b>	209	49.9
<b>Total</b>	419	100.0

Table 4.7 is the analysis of income group of the valid respondents. In the above table, it is found that 49.9 percent (n=209) of respondents does not willing to provide their sensitive information.

**Table 4.8** Demographic characteristic of correspondents follow by Education

<b>Education</b>	<b>Frequency</b>	<b>Percent</b>
<b>Under Graduate</b>	84	20.0
<b>Bachelor</b>	294	70.2
<b>Graduate</b>	41	9.8
<b>Total</b>	419	100.0

Table 4.8 is the analysis of highest education group of the valid respondents. In the above table, it is found that 70.2 percent (n=294) of respondent hold Bachelor degree as their highest education.

#### 4.2 Whole brain thinking of Respondents

Thinking preference of the respondents obtained from questionnaires are analyzed and presented in the following findings.

**Table 4.9** Thinking preference of correspondents follow by Whole Brain Thinking Model

<b>Thinking preference</b>	<b>Frequency</b>	<b>Percent</b>
<b>Quadrant A</b>	210	50.1
<b>Quadrant B</b>	77	18.4
<b>Quadrant C</b>	62	14.8
<b>Quadrant D</b>	70	16.7
<b>Total</b>	419	100.0

Table 4.9 is the analysis of frequency of Whole brain thinking preference of group of the respondents. Respondents are categorized by their Thinking Preference into 4 different brain dominance groups which are Analyzer, Organizer, Personalizer,

and Visualizer from total responses. The above table shows the number and ratio of each group. Quadrant A, B, C, D represents Analyzer, Organizer, Personalizer, and Visualizer, respectively. Quadrant A consists of 210 respondents accounting for 50.1 percent. Quadrant B consists of 77 respondents accounting for 18.4 percent. Quadrant C consists of 62 respondents accounting for 14.8 percent. Quadrant D consists of 70 respondents accounting for 16.7 percent.

### 4.3 Player type of Respondents

Game playing style of the respondents obtained from questionnaires are analyzed and presented in the following findings.

**Table 4.10** Game playing style of correspondents follow by Player Type Theory

Player type	Frequency	Percent
Achievers	77	17
Killers	111	24.4
Socializers	49	10.8
Explorers	182	40.1
Total	419	100.0

Table 4.10 is the analysis of frequency of play style of group of the respondents. Respondents are categorized by their play style into 4 player types which are Achiever, Killer, Socializer, and Explorer from total responses. The above table shows the number and ratio of each group. Achiever consists of 77 respondents accounting for 17.0 percent. Killer consists of 111 respondents accounting for 24.4 percent. Socializer consists of 49 respondents accounting for 10.8 percent. Explorer consists of 182 respondents accounting for 40.1 percent as the highest group. Lastly, missing answers show that respondents responded this question incomplete or not consistence with number of 35 respondents accounting for 7.7 percent.

### 4.4 Whole brain thinking with player type

Whole brain thinking preference and game playing style of the respondents obtained from questionnaires are analyzed and presented in the following findings. Researcher applied crosstabs function between both model and theory in order to analyze data and see percentage of each type of each respondent.

**Table 4.11** Analysis of whole brain thinking with player type by frequency

		Achievers	Killers	Socializers	Explorers	Total
<b>Quadrant A</b>	Count	21	63	35	91	210
	% within Whole Brain	10.00%	30.00%	16.70%	43.30%	100.00%
	% within Player type	27.30%	56.80%	71.40%	50.00%	50.10%
	% of Total	5.00%	15.00%	8.40%	21.70%	50.10%
<b>Quadrant B</b>	Count	28	28	7	14	77
	% within Whole Brain	36.40%	36.40%	9.10%	18.20%	100.00%
	% within Player type	36.40%	25.20%	14.30%	7.70%	18.40%
	% of Total	6.70%	6.70%	1.70%	3.30%	18.40%
<b>Quadrant C</b>	Count	21	6	7	28	62
	% within Whole Brain	33.90%	9.70%	11.30%	45.20%	100.00%
	% within Player type	27.30%	5.40%	14.30%	15.40%	14.80%
	% of Total	5.00%	1.40%	1.70%	6.70%	14.80%
<b>Quadrant D</b>	Count	7	14	0	49	70
	% within Whole Brain	10.00%	20.00%	0.00%	70.00%	100.00%
	% within Player type	9.10%	12.60%	0.00%	26.90%	16.70%
	% of Total	1.70%	3.30%	0.00%	11.70%	16.70%
<b>Total</b>	Count	77	111	49	182	419
	% within Whole Brain	18.40%	26.50%	11.70%	43.40%	100.00%
	% within Player type	100.00%	100.00%	100.00%	100.00%	100.00%
	% of Total	18.40%	26.50%	11.70%	43.40%	100.00%

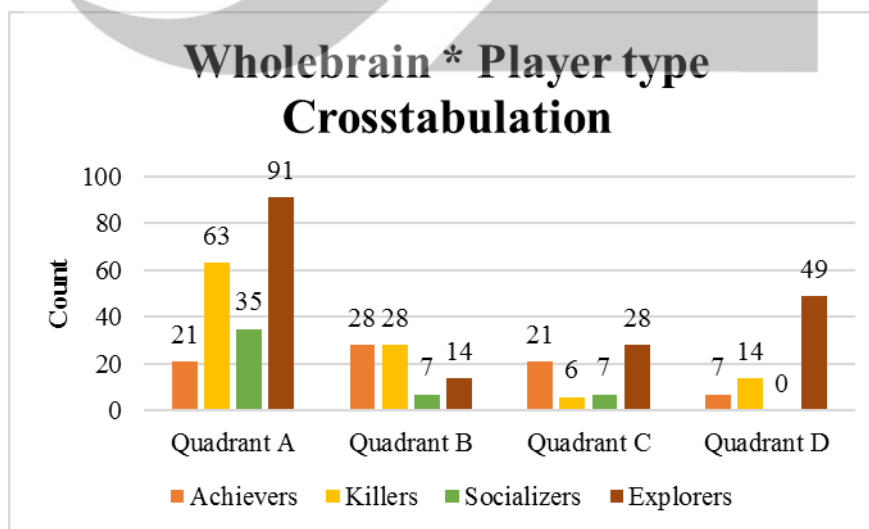
**Figure 4.1** Analysis of whole brain thinking with player type by frequency

Table 4.11 and figure 4.1 in graphical representation are the analysis of frequency of Whole brain thinking preference with player type of group of the respondents. Respondents are categorized by their Thinking Preference into 4 different brain dominance groups which are Analyzer, Organizer, Personalizer, and Visualizer from total responses and also categorized by their play style into 4 player types which are Achiever, Killer, Socializer, and Explorer. The above table shows the number and ratio of each group. Quadrant A, B, C, D represents Analyzer, Organizer, Personalizer, and Visualizer with player type respectively. In Figure 4.1, it is highlighted that Quadrant A with predominantly as Analyzer is most of Thai teenager game player in this research. Most of 43.3 percent in this group indicated to associate with Explorer player style and followed by 30 percent with Killer player style. Additionally, the respondents in this group has mixed of all player styles at 5.0 percent, 15.0 percent, 8.4 percent, and 21.7 percent as Achievers, Killers, Socializers, and Explorers, respectively. Otherwise, in Quadrant D group, the key highlighted Visualizer of thinking preference is associated with Explorer player style consists of 49 respondents accounting for 70.0 percent in its own group. But, the respondents in this group are predominantly 11.7 percent in entire population of the survey as Explorer player style.

**Table 4.12** Chi-Square test of whole brain thinking with player type

	Value	df	Asymp. Sig. (2-sided)
<b>Pearson Chi-Square</b>	79.686 (a)	9	0.000
<b>Likelihood Ratio</b>	88.183	9	0.000
<b>Linear-by-Linear Association</b>	1.535	1	0.215

\*Significant at or below 0.05 level

Table 4.12 with Pearson Chi-Square, it clearly shows that there is very strong evidence of relationship between whole brain thinking model's quadrant and player type theory's player style (Chi-square = 79.686, df = 9,  $p < .050$ ).

**Table 4.13** Lambda or directional measure of whole brain thinking with player type

			Value	Asymp. Std. Error(a)	Approx. T(b)	Approx. Sig.
<b>Nominal by Nominal</b>	Lambda	Symmetric	0.047	0.027	1.738	0.082
		Whole brain thinking preference Dependent	0.033	0.033	1.001	0.317

**Table 4.13** Lambda or directional measure of whole brain thinking with player type  
(Cont.)

		Value	Asymp. Std. Error(a)	Approx. T(b)	Approx. Sig.
	Player type Dependent	0.059	0.027	2.172	0.03
Goodman and Kruskal tau	Whole brain thinking preference Dependent	0.065	0.014		.000(c)
	Player type Dependent	0.07	0.014		.000(c)

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

Table 4.13 shows the strength of a relationship between Whole Brain thinking model's variables and Player type theory's variables. As Player type theory is a dependent variable, there is a significantly (Approx. Sig. = .030 which is less than .050) moderate relationship (Value = .059) based on interpretive guide for measures of association (0.0 = no relationship,  $\pm 0.0$  to  $\pm 0.2$  = very weak,  $\pm 0.2$  to  $\pm 0.4$  = weak,  $\pm 0.4$  to  $\pm 0.6$  = moderate,  $\pm 0.6$  to  $\pm 0.8$  = strong,  $\pm 0.8$  to  $\pm 1.0$  = very strong,  $\pm 1.0$  = perfect relationship).

#### 4.5 Analyzers towards player styles

Quadrant A Brain Dominance will act as an Achievers, Killers, Socializers, Explorer in MMORPG game respectively. In addition, from table 4.8 and 4.9, there is an association between Quadrant A Brain Dominance and game player style of game players. From table 4.4.1 shows that the most frequent play style is an Explorer type at 21.7 percent and followed by Analyzer type at 5.0 percent which is quite small, Killer type at 15.0 percent, and Socializer type at 8.4 percent. As it is the predominant group among the whole population, it is key type of Thai teenager MMORPG game player of thinking preference segment who game developers must concentrate as a target group.

#### 4.6 Organizers towards player styles

Quadrant B Brain Dominance will act as an Achievers, Killers, Socializers, Explorer in MMORPG game respectively. In addition, from table 4.8 and 4.9, there is an association between Quadrant B Brain Dominance and game player style of game players. From table 4.7 shows that the most frequent play style is divided into an

Achievers and Killer at 6.7 percent each. It is quite small population of game players and not compelling to focus on them.

#### **4.7 Personalizers towards player styles**

Quadrant C Brain Dominance will act as an Achievers, Killers, Socializers, Explorer in MMORPG game respectively. In addition, from table 4.8 and 4.9, there is an association between Quadrant C Brain Dominance and game player's style of game player. From table 4.7 shows that the most frequent play style is an Explorer type and followed with Achiever type with also small population of Thai teenager game players in this research. They are also not compelling to focus.

#### **4.8 Visualizers towards player styles**

Quadrant D Brain Dominance will act as Achievers, Killers, and Explorer in MMORPG game respectively. But, there is no proven in this study that Visualizers' thinking type of person would act as Socializer player style. In addition, from table 4.8 and 4.9, there is an association between Quadrant D Brain Dominance and game player's style of game player. From table 4.7 shows that the most frequent play style is an Explorer player type. With 11.7 percent of the population, it is indicated that game developers should look into this segment with game design for Exploring style of game.

#### **Summary**

In conclusion, the detail findings is interestingly found that the statistical significantly variables of the theories are correlated. Most of game players are Explorer player style. All Quadrants of Thinking preferences are correlated with game players' style except Visualizer who will not be associated with Socializer player style variable. In Chapter 5, summary and research recommendation will be included.

## **CHAPTER 5**

### **SUMMARY, CONCLUSION & RECOMMENDATION**

The overriding purpose of this study is to determine the relationship between Whole Brain thinking model and Player type theory toward Thai MMORPG game players. The research is conducted with the objectives to identify and categorize player type of game players, thinking preference of Thai teenager MMORPG game players and investigating the relationship between MMORPG game player personalities based on player type theory and game players' thinking preferences in order to increase sales and opportunities to improve in game development. The correlational research applied quantitative approaches in this study. This chapter is divided into topics as follow:

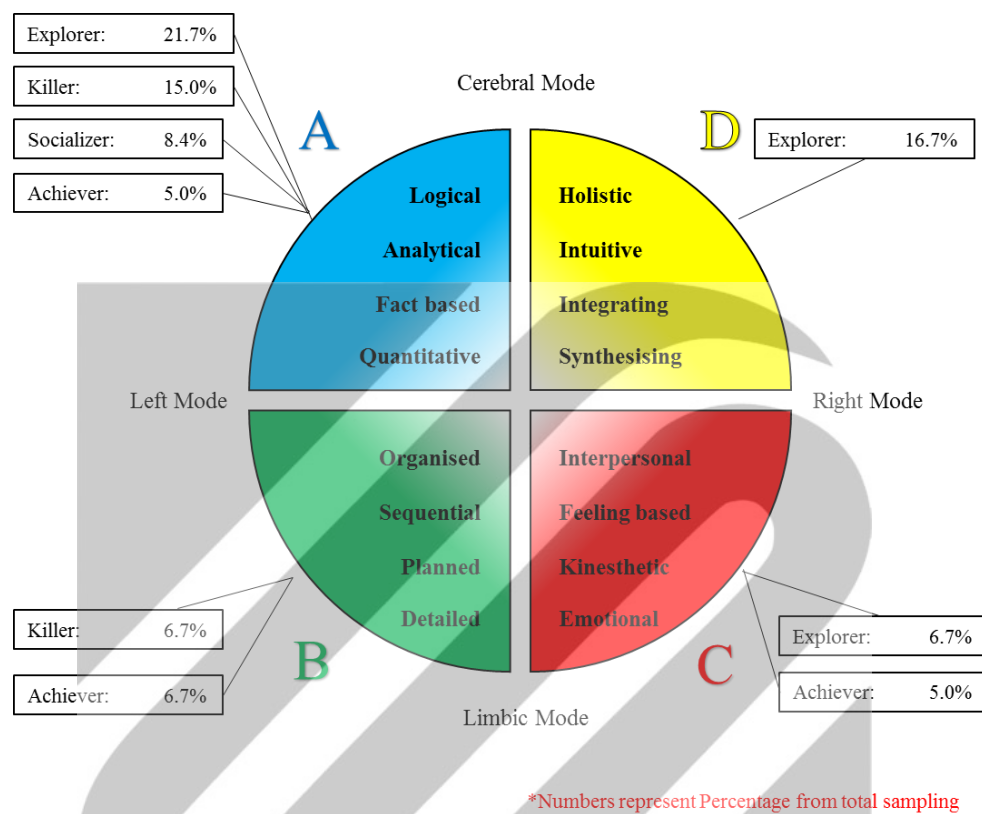
- 5.1 Summary and discussion
- 5.2 Conclusion
- 5.3 Limitations of the Study
- 5.4 Recommendations of the Study

#### **5.1 Summary and discussion**

In two months period of collecting data, 623 respondents kindly helped answering the questionnaires via online channel. However, those 169 respondents ages more than 25 years old are not ones that researcher focused. Therefore, researcher would kindly appreciate to them here. The research population are 419 valid respondents as the study group out of 454 respondents at ages between 15-24 years old players who have played at least more than 1 MMORPG game.

This section reports the results from this study. The study has one main hypothesis. This is relevant hypothesis that directly related to the topic of the study. The findings discovered that there is a very strong relationship between whole brain thinking model and player type theory (Chi-square = 79.686, df = 9,  $p < .050$ ) with only Game player who is a Visualizer does not show the evidence of association as act as a Socializer in MMORPG game. However, the overall result, with Player type theory is

a dependent variable, there is a significantly (Approx. Sig. = .030) moderate relationship (Value = .059) with variables of Whole Brain Thinking preferences.



**Figure 5.1** The relationship between Whole Brain model and Player type theory

In Figure 5.1 above, it depicts of the overall finding of the relationship between Whole Brain model and Player type theory. It is evidently that Analyzer thinking preference style of personality of the study is more compelling segment of Thai teenager game players to be focused by game developers. They are most essential group for game developers to continue to design and sell more personalized MMORPG games with any kind of player style of games to suit them. Additionally, it is future opportunities to cross sell other products or services that fit to this type of person who is more logical thinking like engineers, IT and computer science specialists, etc.

On the other hand, other segments of thinking preference groups of Personalizer and Visualizer who are more emotional and holistic thinking like sales, communication specialists, customer relation specialists, etc. should be offered game

type with new variety of features of adventures to new world. Moreover, the Organizer's preference type of persons who are more sequential and detail like planner, event organizer, etc., should be offered game type with an interesting role play and features of players versus players.

## **5.2 Conclusion**

In conclusion, this research has met the research objectives. It is confirmed to discover the relationship between MMORPG game player personalities based on player type theory and game players' thinking preferences. This research would be beneficial to game development with their focus of design in specific segment of preferences and game player types which would serve personalization trend of gaming industry. In addition, this study can be further researches as recommendation otherwise.

## **5.3 Limitations of the Study**

This section describes about several limitations of this study. Firstly, the sample is focused just on Thai teenager MMORPG game player in Bangkok, Thailand. Therefore, this thesis should only be used to apply in this culture only. Secondly, time for conducting research is limited and also coincidentally, the period which questionnaire is conducted is the period that respondents are busy with studying and working. This research is limited by its use of survey method. On the other hands, there are other methods for examining in-game behavior, including recording and coding actual in-game behavior (McCreery et al., 2012) or analyzing in-game data provided by the game itself (Yee et al., 2011). Coding actual in-game behavior allows researcher to observe behavior of player which actually played but this method is based on the length of game-play time that can feasibly be coded. Downside of this method is that player might act differently than what they normally would do since they know that their game-play is being record. But on the other hand, using in-game data provided by the game itself are accurate but there is a limitation by the types of information provided by the game.

#### **5.4 Recommendations of the Study**

As part of technology growing trends, the following are the researcher's recommendations for future studies and future MMORPG game development. As this research only conduct with sampling group of Thai teenager MMORPG game players, other sampling groups can be interestingly applied and studied. Age of respondents can be broken down into more detail within the range of 15-24 years old for detail analysis would be recommended. Detail questionnaire may be used for future study. Future marketing for more focus segmentation; especially Analyzer preference group is essential for both game design offering and potential other products and services.



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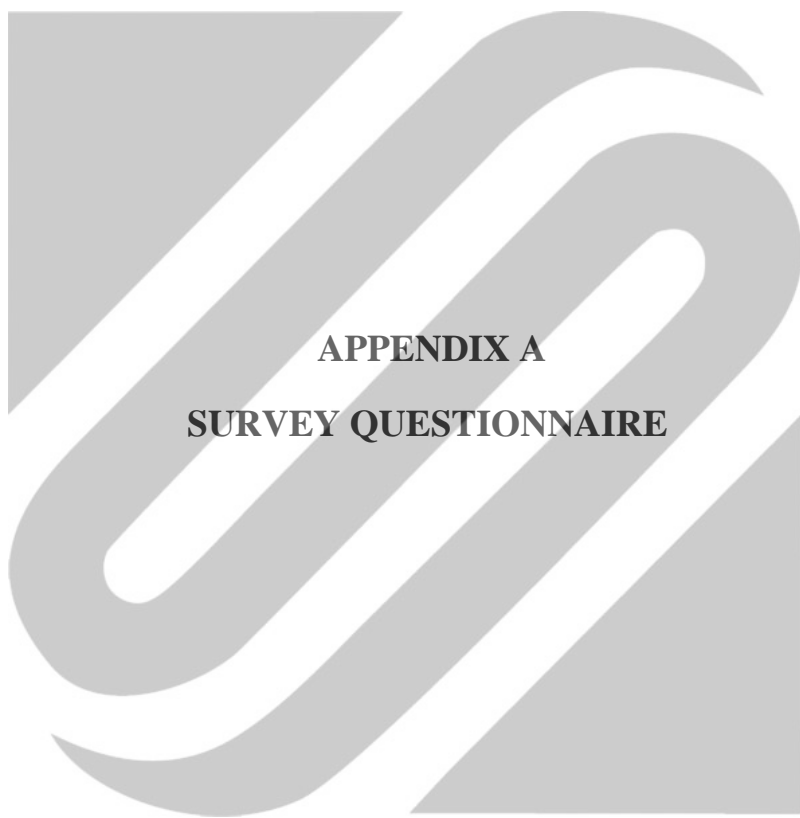
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**APPENDIX A**  
**SURVEY QUESTIONNAIRE**

## แบบสอบถามการวิจัย เรื่อง ความสัมพันธ์ระหว่างรูปแบบการคิดกับทฤษฎีแบ่งประเภทของคนไทยที่เล่นเกม MMORPG

### The relationship between Whole Brain thinking model and Player type theory toward Thai MMORPG game players.

**คำชี้แจง** แบบสอบถามนี้มีวัตถุประสงค์เพื่อสอบถามสไตล์การเล่นเกมส์ เพื่อเป็นส่วนหนึ่งของงานวิจัยความสัมพันธ์ระหว่างรูปแบบการคิดกับทฤษฎีแบ่งประเภทของผู้เล่นเกม ซึ่งจัดทำโดยนักศึกษาระดับปริญญาโท สาขาวิชาการตลาด โดยหลักสูตรบริหารธุรกิจมหาบัณฑิต มหาวิทยาลัยนานาชาติสแตมฟอร์ด ข้อมูลของท่านจะช่วยให้การวิจัยครั้งนี้บรรลุวัตถุประสงค์ เป็นข้อมูลทางวิชาการและเกิดประโยชน์ต่อการพัฒนาเป็นอย่างยิ่ง ดังนั้นผู้วิจัยจึงขอขอบพระคุณ และใคร่ขอความอนุเคราะห์จากท่านโปรดตอบแบบสอบถามให้ครบถ้วน จักเป็นพระคุณอย่างสูง

**Direction** The purpose of this questionnaire is to get feedback of game player style from potential customer. The study focused on the relationship between customers' thinking preference and customers' game player style. This questionnaire is conducted by a graduate student in the field of Marketing of Master of Business Administration, Stamford International University (Thailand). Your answers in this questionnaire will help achieving the objectives of this research. The authors would like to thank and wish you to do this questionnaire completely. Your participation would be highly appreciated.

\*\*\*\* Massively Multiplayer Online Role-Playing Game (MMORPG) เป็นเกมออนไลน์ที่ผู้เล่นหลายคนเข้ามาเล่นในเวลาเดียวกัน และเสมือนอยู่ในโลกเดียวกัน โดยผ่านระบบเครือข่ายคอมพิวเตอร์ขนาดใหญ่ และผู้เล่นแต่ละคนจะสวมบทบาทเป็นตัวละคร

- ตัวอย่างเกมส์ MMORPG เช่น/e.g. Ragnarok, Maplestory, Yulgang, Flyff

\*\*\*\* Massively Multiplayer Online Role-Playing Game (MMORPG) is an online game which can serve a large number of game players simultaneously and every gamer can have interaction with each other in real time.

- Example of MMORPG game Ragnarok, Maplestory, Yulgang, Flyff.

#### ตอนที่ 1 ข้อมูลคัดกรองผู้ตอบแบบสอบถาม

##### Part 1 Sampling filter

- คุณเคยเล่นเกมประเภท MMORPG มาแล้วกี่เกมส์/How many MMORPG games have you played?  
 ไม่เคยเล่นเลย/Never play before                       1 เกมส์/1 game     2-3 เกมส์/2-3 games  
 4-5 เกมส์/4-5 games     มากกว่า 5 เกมส์/More than 5 games
- คุณเล่นเกมประเภท MMORPG บ่อยแค่ไหน/How often do you usually play MMORPG game?  
 น้อยกว่า 4 ครั้งต่อเดือน/Less than 4 times per month                       1 ครั้งต่อสัปดาห์/1 time per week  
 2-3 ครั้งต่อสัปดาห์/2-3 times per week     มากกว่า 3 ครั้งต่อสัปดาห์/More than 3 times per week
- คุณชอบเล่นเกมประเภทไหนมากที่สุด/What is your favorite game genre?  
 MMORPG เช่น/e.g. Ragnarok, Maplestory, Yulgang, Flyff  
 Multiplayer Online Battle Arena (MOBA) เช่น/e.g. DOTA, HON, LOL  
 First-Person Shooting (FPS) เช่น/e.g. Counter Strike, Point Blank, SF  
 Casual    เช่น/e.g. Audition, GetAmped  
 Web เช่น/e.g. Pocket Ali. Adventure quest world  
 อื่นๆ โปรดระบุ/Others .....

## ตอนที่ 2 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

### Part 2 Demographic information

**คำชี้แจง** โปรดใส่เครื่องหมาย ✓ ในช่อง ( ) ที่ตรงกับท่านมากที่สุด

**Instruction** For each question below, please make a ✓ mark that best represents your answer

- เพศ/Gender  
 ชาย/Male                       หญิง/Female
- อายุ/Age  
 ต่ำกว่า 15 ปี/Less than 15 years                       124-5 ปี/15-24 years                       25 ปีขึ้นไป/More than 25 years
- ปัจจุบันคุณทำงานหรือเรียนอยู่/Are you currently working or studying?  
 เรียนอยู่/Studying                       ทำงานอยู่/Working  
 เรียนและทำงานอยู่/Studying and working                       ไม่ทั้งสองอย่าง/Neither both
- รายได้เฉลี่ยต่อเดือน/Monthly income level  
 น้อยกว่า 10,000 บาท/Less than 10,000 Baht  
 10,001-20,000 บาท/10,001-20,000 Baht                       20,001-30,000 บาท/20,001-30,000 Baht  
 30,001-40,000 บาท/30,001-40,000 Baht                       มากกว่า 40,000 บาท/More than 40,000 Baht
- ระดับการศึกษาสูงสุด/Education  
 ต่ำกว่าปริญญาตรี/Under Graduate                       ปริญญาตรี/Bachelor                       สูงกว่าปริญญาตรี/Graduate

## ตอนที่ 3 ข้อมูลเกี่ยวกับทักษะของผู้เล่นเกม

### Part 3 Game players' thinking preference

**คำชี้แจง** โปรดใส่เครื่องหมาย ✓ ในช่อง ( ) จำนวน 5 ข้อ ที่ตรงกับทักษะที่โดดเด่นของท่าน หรือที่ท่านสามารถทำได้ดีที่สุด

**Instruction** Please make **five ✓ marks** that best represents your skills

- |   |  |
|---|--|
| <input type="checkbox"/> การวิเคราะห์/Analytic                        | <input type="checkbox"/> เทคนิค/ วิชาการ/ หลักการ/Technical                |
| <input type="checkbox"/> วิสัยทัศน์/ การมองภาพรวม/Holistic/Conceptual | <input type="checkbox"/> การแก้ปัญหา/Problem-solving                       |
| <input type="checkbox"/> คล่องตัวซับซ้อน/การประยุกต์/Synthesizers     | <input type="checkbox"/> การใช้ความคิดในเชิงสร้างสรรค์/Creative            |
| <input type="checkbox"/> การคิดเชิงเหตุและผล/Logical                  | <input type="checkbox"/> การเงิน/สถิติ/ ตัวเลข/Mathematical                |
| <input type="checkbox"/> การริเริ่มการเปลี่ยนแปลง/Innovating          | <input type="checkbox"/> วางแผน/Planning                                   |
| <input type="checkbox"/> การจัดการ/ ความเป็นระเบียบ/Organize          | <input type="checkbox"/> งานที่เน้นรายละเอียด/Detailed                     |
| <input type="checkbox"/> งานบริการ/Extrovert                          | <input type="checkbox"/> การประสาใจ/Empathetic                             |
| <input type="checkbox"/> การติดต่อสื่อสาร (แบบสองทาง)/Communicator    | <input type="checkbox"/> การทำงานเป็นทีม/Teamwork                          |
| <input type="checkbox"/> การบังคับบัญชา/Dominant                      | <input type="checkbox"/> การแสดงความคิด/ การแสดงออก/Emotional              |
| <input type="checkbox"/> การลงมือทำ/Reliable                          | <input type="checkbox"/> การประสานความคิดที่แตกต่างเข้าด้วยกัน/Integration |

## ตอนที่ 4 สไตล์ของผู้เล่นเกม

### Part 4 MMORPG Game players' style

**คำชี้แจง** โปรดใส่เครื่องหมาย ✓ ในช่อง ( ) ที่บ่งบอกตัวตนของท่านในขณะที่เล่นเกม MMORPG

**Instruction** For each question below, please make a ✓ mark that best represents your characteristic while playing MMORPG game.

- คุณจะเป็นที่รู้จักในเกม MMORPG โดย/ You would rather be known in MMORPG game for  
 เป็นผู้ที่รู้เขอะในเกม/MMORPG/Knowledge                       เป็นผู้ที่มีพลังสูงส่งในเกม/MMORPG/Power  
 เป็นผู้ที่มีความมั่งคั่งในเกม/MMORPG/Wealth                       เป็นผู้ที่มีชื่อเสียงในเกม/MMORPG/Popularity
- คุณมีแนวโน้มในเกม MMORPG ที่จะ/ In MMORPG game, you are tend to

- ( ) รู้ในสิ่งที่ผู้เล่นอื่นไม่รู้/ Know things that no one else does
- ( ) มีไอเทมมากกว่าผู้เล่นอื่น/ Have items that no one else does
- ( ) รู้จักผู้เล่นเยอะมากกว่าผู้เล่นอื่น/ Know players more than everyone else does
- ( ) เป็นที่น่าเกรงขามสำหรับผู้เล่นอื่น/ Known as formidable person in the game
3. ในการเล่นเกม MMORPG คุณจะรู้สึกสนุกมากถ้า/ In MMORPG game, it is more fun to
- ( ) ได้คะแนนอยู่ในอันดับสูงสุด /Have the highest score on the list
- ( ) สามารถชนะในการทำควิลกับเพื่อน /Beat your best friend one-on-one
- ( ) ได้รู้เรื่องราวซุบซิบ นินทา /Getting a latest gossip
- ( ) สามารถใช้เครื่องมือหรือคุณสมบัติที่สำคัญของเกมได้ /Getting to know unique features of the game
4. ในเกมส์ MMORPG คุณอยากที่จะมีเวทมนตร์ที่จะ /In MMORPG game, you would rather have a spell
- ( ) ทำลายล้างผู้เล่นอื่นได้ /to destroy other players
- ( ) กระโดดข้ามไปยังมิติใหม่/teleport to new bonus map
- ( ) ล้วงรู้ความลับในเกมส์ของคนอื่น/to know others in-game secret
- ( ) เก็บเลเวลตัวละครได้เร็วกว่าใคร/to increases the rate at which you gain experience points
5. คุณคิดว่าชอบทำอะไรในเกมส์ MMORPG มากที่สุด / What is your favorite things to do in MMORPG game?
- ( ) ชอบเข่นฆ่า /to kill other people
- ( ) ชอบหาสิ่งใหม่ๆ/ to find new things
- ( ) ชอบพิชิตเกมส์ให้เร็วที่สุด/ to finish the game as soon as possible
- ( ) ชอบเข้าสังสรรค์กับใคร่เพื่อนฝูง/to be in the group to socialize

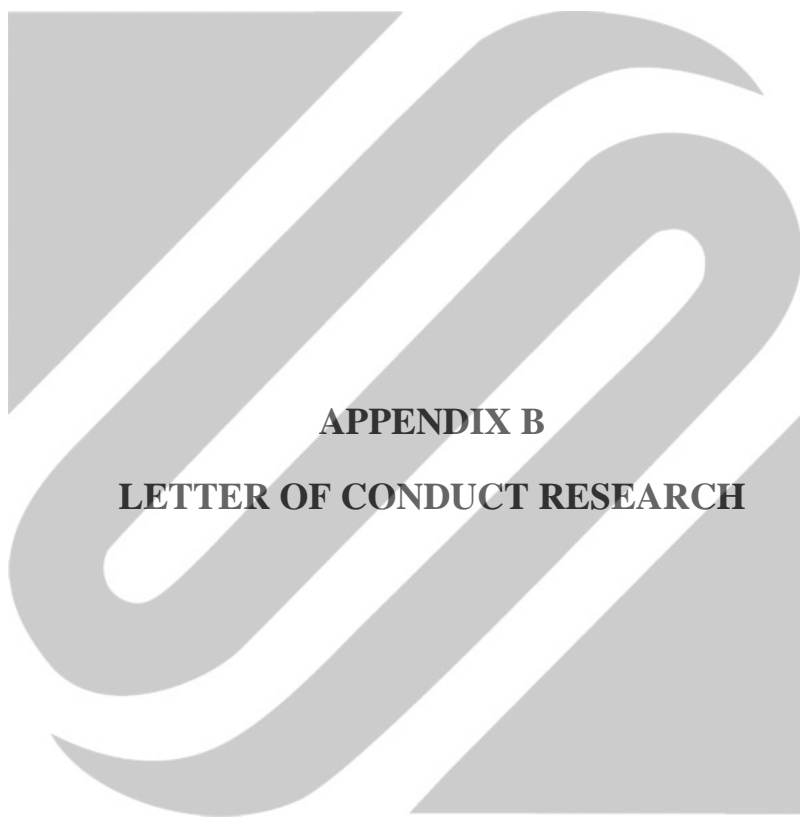
ความคิดเห็น/ข้อเสนอแนะเพิ่มเติม/ Comments/Suggestions

.....

.....

.....

ขอขอบคุณทุกท่านที่ได้ให้ความร่วมมือและช่วยเหลือในการตอบแบบสอบถามในครั้งนี้  
 Thank you for your help and cooperation in this questionnaire.



**APPENDIX B**

**LETTER OF CONDUCT RESEARCH**

GS0115/2014  
16<sup>th</sup> February 2015

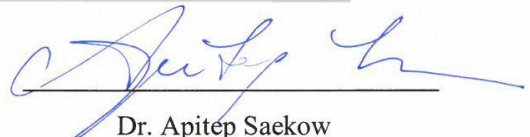
**Re:** Invitation for Questionnaire Evaluation of Expert  
**Attn:** Assistant Professor Dr. Nuttanont Hongwarittorn  
**Attached:** Questionnaire

Stamford international University has been established since 1996 in Cha-am, Petchaburi. Since 2000, we have offered international programs at our Bangkok Campus, which is now located at Rama IX, Bangkok. The university now provides the students with the Master of Business Administration.

On behalf of the Graduate School, Stamford International University, I am greatly pleased to have the honor of inviting you to be a part of experts' panel for our MBA student, "**Mr. Tanarat Hongpaisanvivat**, Student ID. **013233008**", under topic of "**The relationship between Whole Brain thinking model and player type theory.**" under supervised by **Dr. Ake Choonhachatrachai**. I am confident that your qualifications, proficiency, and experience will be beneficial to the students in guiding them towards the successful completion of his research.

Thank you for your cooperation. Please do not hesitate to contact Stamford International University with any concerns you may have.

Yours sincerely,



Dr. Apitep Saekow  
Dean of Graduate School  
Stamford International University

Bangkok Campus:  
16 Motorway Rd., Prawet, Bangkok 10250, Thailand  
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GS0115/2014  
16<sup>th</sup> February 2015

**Re:** Invitation for Questionnaire Evaluation of Expert  
**Attn:** Assistant Professor Dr. Nuttanont Hongwarittorn  
**Attached:** Questionnaire

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Thank you for your cooperation. Please do not hesitate to contact Stamford International University with any concerns you may have.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Apitep Saekow", written over a horizontal line.

Dr. Apitep Saekow  
Dean of Graduate School  
Stamford International University

Tanarat Hongpaisanvivat **Email :** [liv\\_c156@hotmail.com](mailto:liv_c156@hotmail.com) **Tel:** 086-6778553



**APPENDIX C**

**INDEX OF ITEM-OBJECTIVE CONGRUENCE**

### Index of Item-Objective Congruence (IOC)

Questionnaire: The relationship between Whole Brain thinking model and Player type theory toward Thai MMORPG game players.

Question number	Reviews of experts			IOC	Result
	Expert 1	Expert 2	Expert 3		
Part 1					
No.1	1	1	1	1.00	Pass
No.2	1	1	1	1.00	Pass
No.3	1	1	1	1.00	Pass
Part 2					
No.1	1	1	1	1.00	Pass
No.2	1	1	1	1.00	Pass
No.3	1	1	1	1.00	Pass
No.4	1	1	1	1.00	Pass
No.5	1	1	1	1.00	Pass
Part 3					
No.1	1	1	1	1.00	Pass
Part 4					
No.1	1	1	1	1.00	Pass
No.2	1	1	1	1.00	Pass
No.3	1	1	1	1.00	Pass
No.4	1	1	1	1.00	Pass
No.5	1	1	1	1.00	Pass

Expert 1	Dr.Ake Choonhachatrachai
Expert 2	Dr. Nuttanont Hongwarittorn
Expert 3	Dr. Thanasarn Hongpaisanvivat



**APPENDIX D**  
**LIST OF EXPERTS**

## LIST OF EXPERTS

Name – Surname	Position
1. Dr. Ake Choonhachatrachai	Associate Dean Stamford International University
2. Dr. Nuttanont Hongwarittorn	Assistant Professor Department of Computer Science, Faculty of Science and Technology, Thammasat University
3. Dr. Thanasarn Hongpaisanvivat	Associate Partner, Global Business Consulting IBM Thailand Co. Ltd.

## BIOGRAPHY

<b>NAME</b>	Tanarat Hongpaisanvivat
<b>DATE OF BIRTH</b>	15th August 1990
<b>EDUCATION</b>	
<b>2015</b>	Master of Business Administration, Stamford International University
<b>2013</b>	Bachelor of Science, Thammasat University
<b>NATIONALITY</b>	Thai
<b>HOME ADDRESS</b>	29/45 Vibhavadee 22, Vibhavadee rungsit, Jompol, Jatujak, Bangkok 10900
<b>EMPLOYMENT ADDRESS</b>	IBM Solutions Delivery Co., Ltd. 388 Phahonyothin, Khwang Samsaen nai, Khet Phaya Thai, Bangkok 10400
<b>POSITION</b>	Associate programmer analyst
<b>EMAIL ADDRESS</b>	tanarat.hong@gmail.com